

2011 Annual Report: Therapy for the Economy

News at CIRM

Stem Cell Therapy for the Economy

When Robert Wechsler-Reya left Duke University to establish a lab in San Diego he brought with him research that could one day lead to better drugs for treating childhood brain tumors. He also brought additional grant money and new research jobs for California.

Wechsler-Reya is just one of the 130 faculty-level researchers who have relocated stem cell labs to California institutions as a result of CIRM initiatives, bringing with them students, technicians and other lab personnel as well as creating new positions. And where a critical mass of scientists go, industry often follows. California is home to a thriving biotechnology industry with companies relocating or opening offices here to capitalize on CIRM funding, either in the form of research awards or collaborations with CIRM-funded scientists.

This co-location of scientists and companies creates clusters throughout the state, where CIRM-funded programs support existing industry and also spin out new companies. There are starting to be examples of those stem cell research clusters, in turn, drawing additional companies to consider relocating or expanding operations in California.

The stem cell research expansion is already benefiting the California economy. Taking into account only the first \$1.1 billion in funding, by 2014 CIRM's initiatives are expected to have brought in \$200 million in tax revenue to the state and created 25,000 job years—that's economist speak for employing 25,000 people for a year, or 5,000 people for five years. Those jobs each have ripple effects for the state when employed people pay taxes and buy groceries, electronics and homes.

Go West

Wechsler-Reya, now director of the Tumor Development program at the Sanford-Burnham Medical Research Institute in La Jolla, is one of the recent recruits. He was the recipient of a \$5.9 million Leadership Research award from CIRM. These awards were intended to help California institutions recruit top stem cell scientists to the state.

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Another draw to California was the prospect of setting up his CIRM-supported lab in the new Sanford Consortium building near the UCSD campus. The building will house researchers from five different area institutions, all of which have received CIRM awards, including the Salk Institute, Scripps Research Institute, and the La Jolla Institute for Allergy and Immunology, as well as UCSD and Sanford-Burnham. The building was partially funded by CIRM along with a \$30 million private donation from T. Denny Sanford and funds from other private donors.

"One of the amazing things about this place is that there are a lot of interactions not only among academic institutions, but also between academia and industry," Wechsler-Reya said.

"It is the kind of thing that I could not have done back east."

It was also a Research Leadership Award that drew Peter Coffey to set up his lab at the University of California, Santa Barbara, where he is director of the Center for the Study of Macular Degeneration. He has been working toward a stem cell-based therapy for the most common form of blindness, called macular degeneration.

Coffey was an adjunct faculty member at UCSB while he was still at University College London in England. He is in the early stages of setting up his new lab. Eventually he expects to have a top line group of postdoctoral researchers, graduate students and technicians working on diseases of the eye.

Coffey said that one of the challenges is translating laboratory discoveries in cells in the laboratory into therapies for use in humans.

"It takes more than just biology, you need people that are involved in producing platforms to deliver cells," Coffey said. The biological

engineering group at UCSB, some of whom have CIRM funding, has the needed expertise, Coffey said, and offered an opportunity for further collaboration that he didn't have in London.

At UCSB Coffey is also well positioned to participate in the \$15 million macular degeneration disease team led by Mark Humayun at the University of Southern California. Coffey was part of the collaboration while in London, but can now interact much more closely with the group, which expects to have a therapy in clinical trials in the next few years.

Macular Degeneration: Progress and Promise in Stem Cell Research

Where researchers go, industries often follow

The burgeoning amount of stem cell research in the state is starting to lure private biotechnology companies that are either planning to or have already located or expanded their facilities in California.

The Jackson Laboratory, based in Maine, is one example. They greatly expanded their west coast operation in 2009, when they received CIRM funding to increase their ability to provide animal services to stem cell researchers, said Leon Hall, Director of Scientific Operations. In 1999 they had made their first move to the west coast, partnering with UC Davis to provide mouse strains to researchers. Within two years, the company opted to establish an independent west coast operation that today employs approximately 120 people.

"It was made clear to us by the research community that there was a need for standardized and well-characterized mouse models of human diseases that could be leveraged to help eliminate this bottleneck to the translation of basic research in stem cell-based therapeutics," Hall said.

"I wonder whether we would have been able to make even a dent in the development of those models without the CIRM funding."

A member of the research faculty at Jackson Laboratories named Lenny Shultz had developed a "super immune-compromised" mouse that Hall said was an ideal host for testing human cells, including stem cells. Other immune-compromised strains of mice were available, but all were less than optimal. Even though Jackson Labs had both the supply and the demand, they lacked the funding to develop the mouse for the different markets. Hall said that each disease being studied needs a mouse model tailored to that particular disease.

"I wonder whether we would have been able to make even a dent in the development of those models without the CIRM funding," Hall said. The company received an Early Translational award from CIRM in 2009 and is now distributing mice for use in three disease areas to researchers. Four additional mouse models should be available later this year, according to Hall.

Providing the mice and materials for conducting basic research is vital, but collaborations with industry providing research services is also essential to the rapid development of novel therapies.

"There is such a mass of stem cell scientists in California, there are industries that are being set up, that need to be set up, to produce the therapeutics needed for use in clinical trials," said Coffey.

In the next few years several CIRM-funded teams expect to reach clinical trials with more anticipated in coming years. Those trials will support new companies, Coffey predicts, creating new jobs in California.

Medical researchers talk about taking a therapy "from bench to bedside." That same mantra applies to job creation, where each step in the process of taking a good idea in the lab and turning into a therapy for patients brings new jobs and investment in the state. Funding

stem cell research not only serves patients, it also serves to help build a stronger California economy.

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